

What is claimed is:

1 1. A method for adaptation of a computer system, network or
2 subsystem comprising developing a design for the system and
3 performing an automated loop comprising implementing the design;
4 analyzing operation of the design after said implementing; and
5 modifying the design based on results of said analyzing.

1 2. The method according to claim 1, further comprising forming
2 models of components of the system and applying results of said
3 analyzing to the models.

1 3. The method according to claim 2, wherein said applying results
2 of said analyzing to the models indicates utilization of a component of
3 the system.

1 4. The method according to claim 3, wherein said modifying the
2 design is performed in response to the utilization.

1 5. The method according to claim 4, wherein said modifying is also
2 performed in response to a desired headroom level.

1 6. The method according to claim 5, wherein said desired headroom
2 level provides that components of the system operate at less than 100%
3 utilization.

1 7. The method according to claim 7, wherein said desired headroom
2 level provides that components of the system operate at more than 100%
3 utilization.

1 8. The method according to claim 1, wherein said implementing the
2 design comprises forming a plan and then implementing the plan.

1 9. The method according to claim 1, wherein said system comprises
2 a CPU farm.

1 10. The method according to claim 1, wherein said system comprises
2 a data caching system.

1 11. The method according to claim 1, wherein said system comprises
2 a database system.

1 12. The method according to claim 11, wherein said modifying
2 comprises modifying indices of the database system.

1 13. A method for adaptation of a data storage system, comprising
2 developing a design for the data storage system and performing an
3 automated loop comprising implementing the design; analyzing
4 operation of the design after said implementing; and modifying the
5 design based on results of said analyzing.

1 14. The method according to claim 13, further comprising forming
2 models of components of the data storage system and applying results of
3 said analyzing to the models.

1 15. The method according to claim 14, wherein said applying results
2 of said analyzing to the models indicates utilization of a component of
3 the data storage system.

1 16. The method according to claim 15, wherein said modifying the
2 design is performed in response to the utilization.

1 17. The method according to claim 16, wherein said modifying is
2 also performed in response to a desired headroom level.

1 18. The method according to claim 17, wherein said desired
2 headroom level provides that components of the data storage system
3 operate at less than 100% utilization.

1 19. The method according to claim 17, wherein said desired
2 headroom level provides that components of the data storage system
3 operate at more than 100% utilization.

1 20. The method according to claim 13, wherein said implementing
2 the design comprises forming a plan for migrating data and then
3 implementing the plan.

1 21. The method according to claim 20, wherein said forming a plan
2 comprises forming a directed multigraph and computing a maximum
3 general matching.

1 22. The method according to claim 13, wherein said analyzing
2 comprises forming a trace of storage system events and forming a
3 workload characterization based on the trace.

1 23. The method according to claim 22, wherein said workload
2 characterization comprises a number of parameter values that
3 summarize the trace.

1 24. The method according to claim 23, further comprising forming
2 models of components of the data storage system and applying said
3 workload characterization to the models.

1 25. A method for adaptation of a data storage system, comprising:
2 developing a design for the data storage system;
3 implementing the design;
4 forming a trace of storage system events;
5 forming workload characterization from the trace;
6 applying the workload characterization to models of components
7 of the data storage system, wherein said applying indicates utilization of
8 a component of the data storage system; and
9 modifying the design in response to the utilization indicated by
10 said analyzing.

1 26. The method according to claim 25, wherein said modifying
2 results in a modified design and further comprising implementing the
3 modified design.

1 27. The method according to claim 26, wherein said modifying
2 comprises forming a device tree data structure that is representative of
3 the storage system.

1 28. The method according to claim 27, wherein said modifying
2 comprises reassigning data stores to components of the data storage
3 system.

1 29. The method according to claim 28, wherein said implementing
2 the modified design comprises forming a plan for migrating data and
3 then implementing the plan.

1 30. The method according to claim 29, wherein said forming a plan
2 comprises forming a directed multigraph and computing a maximum
3 general matching.

1 31. The method according to claim 25, wherein said modifying is
2 also performed in response to a desired headroom level.

1 32. The method according to claim 31, wherein said desired
2 headroom level provides that components of the data storage system
3 operate at less than 100% utilization.

1 33. The method according to claim 31, wherein said desired
2 headroom level provides that components of the data storage system
3 operate at more than 100% utilization.